

Madagascar

Business and Market Expansion Program (BAMEX)

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Essential Oils and Spices: Trip Report Initial Start-Up Visit

Submitted to:

USAID Madagascar

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1. INTRODUCTION

The consultant was in Madagascar from the 20th to the 30th of October to initiate BAMEX activities in the essential oils and spices sectors. Meetings were held with a number of Malagasy companies involved in the production and export of spices, essential oils and medicinal plants to gain an understanding of their current operations and the key constraints they currently face. The consultant also provided expert consulting to BAMEX and local business with regards to world market demand and characteristics for essential oils and spices. Discussions were also held with the project team, and in participation in the BAMEX/USAID teambuilding/work planning workshop, to define work requirements and to establish next steps and planned activities.

Per USAID's request, this report focuses on providing initial review of market potential for key crops as well as product profiles and looks at constraints and opportunities for major products in the essential oils and spices sectors. It provides a preliminary demand analysis for selected crops as well as examining supply and production issues, utilizing a demand driven approach.

Most of the “sellable” essential oil and spices being currently produced are already reaching market. Though, through increased quality, improved post harvest handling, and developments of value added goods, product prices and reputation can be enhanced. Production constraints is presently a key issue for several products in the sectors and BAMEX will need to focus on crops/products where there is the potential for sizable increase in market volumes and values to reach its sales targets. Additional issues that the project will need to address are better integration along the value chain and developing alternatives to the current buyer ruled relationship—both which limited sale prices of goods and the development of additional market opportunities. Full recommendations are contained at the end of this report.

2. SITUATIONAL ANALYSIS/CONTEXT

- Madagascar produces a number of different spices and essential oils – some have large terminal markets (cloves, pepper, etc), while others have small markets (ravintsara and other minor essential oils)
- Given the significant value target (US\$25 million) the project must achieve, one priority should be to target crops/products where there is scope for substantial increases in market volumes and values. Further demand analysis of existing and potential markets will assist BAMEX to further refine its interventions.
- For most crops (except some wild harvested essential oil crops), all existing production is sold. Therefore, achievement of a significant increase in market volumes depends on an increase in production
- Strategies to deliver increased production within the timeframe of the project will have to focus on:
 - A concentration on annual crops where the production area can be rapidly expanded – ginger, capsicums
 - Reduction of losses in the marketing chain – particularly in the post-harvest handling chain

- Improvement in crop yields – through cross-cutting activities in production technology (use of fertilizers, pest control, etc)
- Value and margins will also be increased by:
 - improvements in quality and enforcement of standards
 - production of value added products – grinding, distillation and extraction

3. KEY CONSTRAINTS TO BUSINESS AND MARKET DEVELOPMENT

From meetings with companies, sector representatives, BAMEX and USAID staff, it is clear that there are a number of common constraints that limit the ability of many companies to service defined needs and opportunities in the markets:

- the fragmented character of the production/marketing chain, preventing processors/exporters from influencing/determining the scale of production and the quality of production
- Lack of information regarding the international, regional, and local demand for products. Many companies are still stuck in a “sell what you can produce” mindset instead of a “produce what you can sell” focus.
- the lack of understanding in the small company sector – or their reluctance to admit – that the producer/collector network on which they rely for raw material supply are an integral part of their business
- the restricted number of companies in the sector with strong management and technical and financial resources
- the ability of many small companies to be able to properly provide buyers the services they now require is marginal – and hence their continuing dependence on long term (primarily French) buyers in trading relationships where little is demanded of the supplier – and in consequence little returns.

4. PRELIMINARY MARKET REVIEW AND ANALYSIS OF PRINCIPAL CROPS

4.1 Clove

Madagascar is a long establish origin in the markets – and intrinsic quality of the product is good. The primary market is Indonesia (where cloves are used in the local keretek cigarettes). The Indonesian market is for up to 30,000 tonnes, whereas total Western demand is less than 5,000 tonnes. Madagascar's market depends on continuation of Indonesian demand. If and when this market is disturbed (as has occasionally happened in the past), as Indonesia is also a substantial producer, there is no compensatory alternative market. Madagascar has no control over this. The scale of global export production (Zanzibar and Brazil are also major producers) is predicated on the Indonesian market.

Clove is a long term perennial tree crop. Hence, there is little or nothing that the project can do to alter short to medium term production levels. The crop is sun-dried by producers, and it is not clear that any mechanised sorting/cleaning facilities exist to allow grading out of premium grades for premium markets. While the phytosanitary condition of the bulk crop may not be a critical issue for the Indonesian market, sun drying on the ground and subsequent poor conditions for handling and storage result

in product with a high risk of high microbial/fungal loads. This lowers market value/position in Western markets, and places Madagascar in a weaker position vis-à-vis other major suppliers (Zanzibar, Brazil) to Indonesia (Zanzibar has a mechanised cleaning/grading plant, and Brazil has crops from the plantation sector).

Clove bud oil is one of the major essential oil crops of the sector, with good added value. The ability of small distillation companies to produce more – for which they state that they have the market – is constrained by limited working capital and access to affordable credit. Clove leaf oil is a lower value bulk oil.

4.2 Pepper (black pepper)

Madagascar pepper is well regarded in the trade for its intrinsic quality (i.e. its chemical profile), but production levels have remained largely static. This is in contrast to some other countries, notably Vietnam, where production has increased from low levels to over 60,000 tonnes over the past 10 years. In a global market of over 150,000 tonnes there are always opportunities to find additional markets for several thousands of tonnes if costs of production are competitive – which should be the case in Madagascar.

Pepper is a perennial vine crop, with first yields only 3 years after initial planting. Although the promotion of planting is not likely to significantly change output levels during the life of the project, it is clear that the crop should be promoted on its future market potential.

Production and post harvest handling of pepper is basic. As a result, yields are low and losses of product and quality will be high. Changes in the technology of production and post harvest handling can result in significant increases in marketable output, improvements in quality, and hence revenues, returns and margins.

Black pepper oil is another of the important essential oils produced, and as noted for clove bud oil, the ability of the small distillation companies to increase production is limited by lack of access to working capital.

4.3 Ginger

Although current production of the crop is small, planting material is available and production could be expanded rapidly. The market for ginger products is complex and therefore potentially attractive as it can offer very significant scale and product diversity. The current focus is on production of dry ginger (the spice) where end usage can be the dry ground spice, or for extraction (ginger extract) or distillation (ginger oil). The dried spice market is reasonably large, possibly around 5,000 tonnes or more, and certainly an attractive target for substantial development for Malagasy producers. Targeting other ginger product markets will depend on the precise characteristics of the variety/varieties grown in the country, but potentially could include: fresh ginger (the largest market, around 20,000 tonnes in the EU); immature fresh ginger (niche market, air freighted); ginger in brine (very large market in Asia); and crystallised and syruped ginger (a confectionary product, around 4,000 tonnes in the EU). In the short term, the opportunity for competitive supply to the dry ginger markets should be targeted.

There was previously some distillation of fresh ginger – though it is reported that this market has declined in both volume and value and is not of current interest. The standard ginger oil is distilled from dry ginger. Yet, none of the companies met produced this as a standard item, and the market is not large. There is reportedly some extraction of ginger but the scale is unknown, and the competitive position relative to the industry in India is unlikely to be strong.

4.4 Cinnamon

Madagascan cinnamon is of good intrinsic quality and well regarded in comparison with supplies from Sri Lanka (the market leader). The overall market combines both cinnamon and cassia (major cassia origins being Indonesia, Vietnam, and China). In general terms, the EU uses cinnamon while the US uses cassia. It is unlikely that Madagascar can compete with Sri Lanka in the fine 'quills' market (rods of rolled bark). Very considerable improvements would be needed in production and post-harvest handling to achieve Sri Lankan levels of product presentation. However, Madagascar could be highly competitive in supply to the market for ground product. Other major markets for cinnamon are Mexico and the Central American countries.

Cinnamon is a perennial crop, with production starting around 3 years after planting. The crop has strong ecological benefits – in terms of erosion control and soil improvement, and also yields waste wood material after stripping of the bark that can be used to fire driers. There is an opportunity to significantly improve post harvest handling, and therefore both quality and marketable yield.

Cinnamon bark oil, as with pepper and clove bud oil, is an important crop for the small distillation companies, and the constraints to increasing production are the same as previously mentioned.

4.5 Turmeric

Although this is an annual crop – very similar to ginger in production terms – there are no significant market opportunities. Global supply is dominated by India – with a domestic crop of over 150,000 tonnes. Western demand is small. The EU market is around 6,000 tonnes, and all except about 250 tonnes is supplied by India. The US market is around 2,500 tonnes with similar total domination of supply by India. Thailand and Peru make small erratic supplies to the Western markets, but rarely more than 100 tonnes per year. The domination by India is partly based on its very large supply, and partly on the well established characterisation – and acceptance by the trade – of its major turmeric types (Madras types for spice uses and Alleppy types for the food colorant market).

4.6 Capsicums (covering Capsicums, Chillies and Paprika)

Product definitions are frequently confused, and published market statistics (based on import data and customs codings) are similarly confused. In general terms:

- chillies are assessed on the basis of their pungency (usually in terms of capsaicin content)
- capsicums are assessed on a combination of colour and pungency
- paprika is assessed on the basis of colour (generally in terms of ASTA colour units)

Madagascar is known as an origin of 'birds eye' chilli types – small, highly pungent chillies, supplied by a number of East African countries. 50 years ago, birds eye chillies dominated supply to the western extraction markets. Their place has now been taken by a number of other types (the Habenero and other Scotch Bonnet types and a number of Chinese types) that are as pungent if not more so, are much larger (which drastically reducing the main production cost of picking), and are higher yielding. The market for birds eye chillies is now more a niche market with much of the supply going into the retail markets as whole chillies. Prices are at a premium to the main chilli types, but volumes are small.

The main market for all forms of Capsicums (chillies, capsicums, paprika, whole and ground) is large – around 120,000 tonnes equally divided between the EU and US. Of the total, paprika probably accounts for around 30,000 tonnes. The remainder is a wide range of chilli/capsicum types, of which around 40,000 tonnes is traded as ground product. The major opportunity for Madagascar will be the development of production and supply of other, non-birds eye types. Southern Africa (primarily South Africa and Zimbabwe, but with some development in Zambia and Malawi) have developed very substantial production of paprika types over the last 15 years – with production of around 15,000 tonnes. More recently, in the last 5 years Peru has come into the market with over 5,000 tonnes. In a market of this size – a commodity market – competitively priced material meeting defined product characteristics required will find buyers through replacing other origins.

The products come from a range of species – *Capsicum annum*, *C. chinense*, and *C. frutescens*. The species are annuals or short term perennials (which crop in the first year). All are seed propagated. There are well defined commercial seed varieties available from major multinational seed houses (Pioneer, etc) for both paprika types (Papri King and Papri Queen) and chillies/capsicums. It is therefore possible to expand production very rapidly (where importation of certified seed is allowed).

While Madagascar can promote its birds eye chilli in the market, the main opportunity will be in the development of a substantial production sector of other chilli/capsicum types, and paprika types.

Capsicums, paprika, and to a lesser extent chillies are a substantial feedstock to the extraction industry. Much of this industry has moved back to origin, but caution needs to be taken over consideration of any development of this sector in Madagascar. India has (finally) developed a very successful extraction industry, and now dominates supply of extracts (including a broad range of other spice extracts as well) to the western industry. India is able to mobilise very substantial investment capital, and has a very strong technology/technician base. In addition to the production of standard paprika, capsicum and chilli (capsaicin) extracts, it has now developed a paprika oleoresin ex-capsicum which substantially undercuts the price of true paprika oleoresin (the capsicum oleoresin is split out to give a paprika oleoresin, and a capsaicin oleoresin – enabling India to use very low cost high volume domestic capsicum supply to make a high value product which it can market at a substantial discount to the standard paprika oleoresin ex-paprika).

Globally there is an excess of extraction capacity. In Southern Africa there are 4 extraction plants that have been established to process the paprika produced there, but

very little oleoresin is produced and few if any of the plants can be operating profitably. The large 250 ton extract capacity plant established in Zambia is barely used, for example. Unless Madagascar can secure market access for oleoresins, it should concentrate on development of the dried spice industry first.

4.7 Vanilla

The market for cured vanilla has been radically affected by the recent high product prices, and apparent global demand has fallen from around 2,200 tonnes to under 1,000 tonnes in the current year. The reduction in demand has occurred from 3 principal factors: usage of stocks held in the market, reformulation of products to use synthetic sources and usage of synthetic sources without formally notifying the market of a reformulation – (in other words, 'cheating'). It is not yet clear whether, and to what extent, the restructuring of prices for cured vanilla that has been 'agreed' will stimulate demand. Given the uncertainty over the stability of the new floor price, industry in the market may be cautious over restocking. Companies who have formally changed product formulations are unlikely to revert to use of the natural product without substantial confidence over long term price trends (the avoidance of future price spikes). Policing of product market regulation compliance (largely product label legislation) is dependent on the actions of market authorities, and therefore how they respond to requests by Madagascar (and other producers) to investigate and enforce compliance.

Stimulation of demand is clearly critical for Madagascar. Whilst export earnings from vanilla have been abnormally high over the past few years (exports to the US market alone were over US\$100 million in 2002 and US\$177 million in 2003), the reduction in export earnings is going to be a real loss to the sector. Total export values for 2004 will be high due to the high prices to date, but revenues in 2005 could well be only around US\$25 million.

Even at low prices for vanilla (say US\$25/kg), it is still a high priced product when compared to almost all other spices. Assistance in getting back just 100 tonnes of market would deliver US\$2.5 million even at these prices. Reports are that the current crop is around 2,000 tonnes of cured beans, so there is a potentially very substantial excess of production over current demand – the exception to all other crops targeted. The crop and its market must therefore be of interest to the Project – thought it has to be recognised that other Donor programmes (notably the EU Stabex programme) are also active in this area, and any activities would have to be coordinated on a sector basis.

Madagascar's traditional image in the market has been as the dominant supplier of high quality vanilla – the bourbon origin characteristics taken as the definition of preferred quality. Indonesia has supplied the low quality market – almost exclusively linked to a particular label niche in the US market that allows mixing of natural and synthetic vanilla in the same product. The problem for Madagascar is that a number of other origins have developed supply targeting the high quality market, and although all are small by comparison (Uganda around 50 tonnes, India around 30 tonnes but growing and Papua New Guinea probably around 200 tonnes), all can offer a supply chain with much greater linkage development between producer-processor-exporter, and therefore control over the product and the ability to develop a service to the buyer.

The project could initially focus on the need to bring buyers back to the market, but should also consider the opportunity of the current fall in demand to look at the potential for creating more vertically integrated operations that can control product quality and deliver a more comprehensive service to buyers.

4.8 Other essential oils

A number of other essential oils are distilled by companies in the sector, but total volumes and values for each oil are relatively small. A general observation would be that market demand is limited. In some cases – *Calophyllum inophyllum* for example – there are substantial wild raw material resources that could support substantially increased output, but considerable work would have to be done on market development to create the necessary demand.

The exceptions to the above are: *Eucalyptus citriodora* and *E. globulus*, vetiver, geranium and ylang ylang. No companies were met who produce these oils, although the market for each is significant in value terms. The markets for Eucalyptus oils are well established. *E. citriodora* may well offer opportunities as Chinese export production declines. Geranium production has started in Madagascar, but market supply is constrained by crop production – geranium is not an easy crop to maintain in a productive condition over the medium term. The dominant supplier to the vetiver market is Haiti. Recent disruption in Haiti will create short term opportunities, and there will always be interest from the trade in considering other less volatile origins. The ylang ylang market is well established and buying is likely to remain dominated by France since the usage is exclusively perfumery, distillation yields a complex of grades with appropriate pricing, and demand will depend on the output of the dominant supplier, the Comoros. The production sector is well established around Nosy Be and the adjoining mainland, with organised plantings. No immediate opportunities for new market development are apparent.

5. RECOMMENDATIONS

On the basis of this short visit and current market conditions, a number of recommendations can be made for early specific consideration by BAMEX:

- i. Do more targeted research to better determine the market demand for key Malagasy products in the essential oils and spices markets. Use this market driven approach to determine further scopes of intervention based on identifying products with strong market potential and adequate production and quality levels.
- ii. Ginger and capsicums (all types) offer the necessary market scale to provide the scale of export development that the project needs to pioneer. Vanilla has to be considered a potential target, though the role for the project needs to be worked out in consultation with other partners
- iii. Ginger: to be able to understand market potential, and market positioning of Madagascar's product, the project must understand the characteristics and

properties of the domestic planting material – the variety/varieties. Key issues to be determined include:

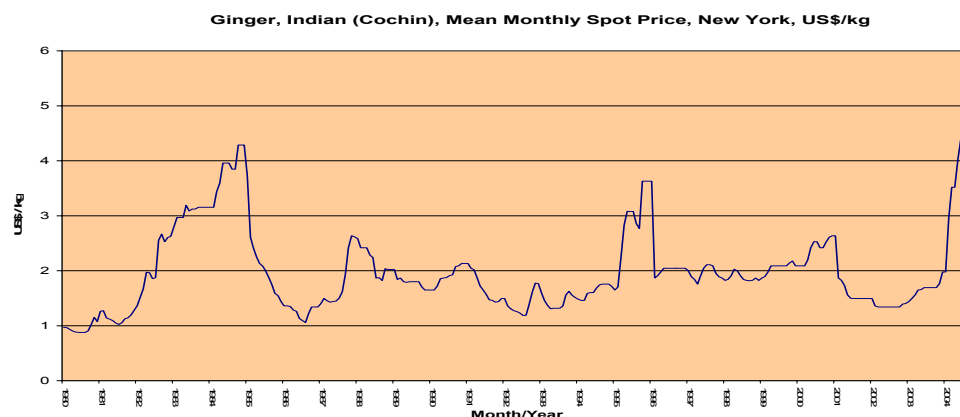
- a. Average extractives content (what is the average extraction yield). The Natoria specification does not address this, and simply gives a minimum essential oil content. One market for dry ginger is the extraction market, and a high extract ratio (as found in Nigerian and other West African origins) is a competitive advantage. If there is no data available on this, it should be established (with material of known age)
 - b. Aroma profile of the oil (from dry ginger), and of the ground dry ginger. Replacement of Indian ginger in the market by material of equivalent characteristics would deliver demand and value. Indian ginger is characterised by citrus or lemon-like top notes, and this is liked in the markets. If a similar profile was present in Madagascar for ginger, it would help in positioning the product and add to a competitive advantage package.
 - c. Assessment/identification of varieties of planting material. Is there a single local type – or are there a number of distinct and easily recognised types.
 - d. Crop economics: baseline data is required on standard production input/output, and the benefits to improved practices – this needs to be collated from past work, or established from field work on farmers fields if it doesn't exist. Crop multiplication rates (harvest yields in relation to weight of seed material actually used) are a fundamental determinant of competitive position in the market and of the ability to rapidly expand production areas.
 - e. Crop development cycle – the build-up of fibre levels. The suitability of ginger for all markets, but particularly the fresh market, is partly determined by level of fibre development – which is a factor of crop age and variety. A practical study is required – based in commercial plantings – of % fibre development in the rhizomes from 4 months after planting until harvest, at a minimum of monthly intervals. This should be linked with parallel assessments of fresh rhizome yield, and levels of oil and total extracts in the rhizomes. This data will allow market suitability to be appraised, and production protocols to be refined.
 - f. Post harvest handling. Ginger requires washing and drying after harvest. There is a massive bulk of material to handle prior to drying – with significant cost and time implications once growers are encouraged to increase cultivated areas. The drying process also has significant time, cost and product hygiene implications. This has to be addressed if there is to be widespread uptake of cultivation, and if a competitive position is to be established in the market.
- iv. Capsicums: the commercial sector should be encouraged, and assisted to introduce and assess the core paprika varieties.
- a. Large plot observations should be targeted rather than formal experimental field plot trials. Target locations should be the highland areas. Key issues for assessment are yield, colour values of the harvested material, and whether pungency develops.

- b. In addition to the domestic birds eye chilli, are other local types of chillies or capsicum cultivated? If they are, assessments should be made of crop yield, and pungency and colour content of the harvested crop.
- v. Crop drying: this has a major impact on crop quality, post-harvest losses and marketable yield, and the hygiene status (microbial and fungal loading) of the dried crop – all of which effect market parameters (volumes, price, competitive position, etc) of direct relevance to the project and its objectives. Improved drying technology – specifically where the crop is raised off the ground, protected from the weather, and dried by artificially heated air using *indirect*¹ heating systems – will make the single biggest difference to spice crop quality, and usually also makes a very significant impact on producer productivity. The project needs to address this – and simple wood fired heating systems (linked to woodlot developments) must be included in the list of systems to be considered, as they are likely to be the most cost efficient and have the most widespread applicability and uptake.
- vi. Cleaning and grading systems. From the limited discussions held with companies, it is not clear how, and to what extent, spice crops (other than vanilla) are cleaned and graded prior to export, and specifically what mechanical systems (if any) are used. Whilst the current crops are sold, market security, and market position and hence price, are determined by product cleanliness and hygiene, and achievement of this provides a base on which to build grading. Whilst Madagascar has the current opportunity to leverage its exchange rate and cost structure to take market share by price, this can't be seen as a long term strategy. In addition, other origins are changing and improving their practices in this area. Mechanical cleaning/grading systems can have high throughputs. If individual companies/exporters are not leading the way in this area, consideration can be given to the development of service companies (the equipment is multi-purpose) – this has worked in other countries. It is premature to consider crop sterilisation units (such as flash steam sterilisation units), but crop hygiene needs to be continually monitored.

¹ Air is drawn over a contained heat source and then passes on through the crop to be dried. The exhaust fumes/smoke etc from the heat source do not pass through the crop.

ANNEX 1: DRAFT PRODUCT MARKET PROFILE: GINGER (DRY)

Price Evolution:



Dry ginger prices are volatile, with a base price of around US\$1/kg, and a long term average of around US\$1.50/kg. Current prices are high (marker Chinese prices in excess of US\$2/kg) due to shortage of Indian supply – this is possibly a structural change in market supply as India changes from exporter to net importer.

Global and Regional Trends

Chinese supply dominates market in all forms (fresh, dry) and for all usages (fresh, dried ground, oleoresin extraction, distillation) due to price and availability. India is changing to net importer, and has additional needs to supply expanding extraction industry. India becoming a major source of spice extracts, and will import dry ginger to meet raw material requirements.

Import statistics for ginger do not distinguish fresh and dry – total Western ginger market (EU and US) around 50,000 tonnes/yr and growing. The estimated dry ginger market is around 5,000 tonnes/yr.

Ground ginger (at origin) is small but growing market – in the US, imports increased from 500 tonnes to 1,250/yr over last 5 years. The situation is similar in the EU. Supply is dominated by China.

Main competitors

China is the dominant market player. West Africa (Nigeria) was a significant supplier to extraction industry, but demand for Nigerian product is now very low due to earlier poor trading practices. It is unlikely that the country will become a significant supplier again. India is likely to become a net importer. Other major origins (Central & S America, SE Asia) are all fresh ginger producers. Ground ginger supply is dominated by China, and then India.

Market opportunities

Immediate opportunity: supply of whole dried ginger (not ground) to EU, US and Indian markets. Initial target of 1,000 tonnes/yr.

Medium and long term opportunity: ginger offers a range of product opportunities in addition to dry ginger – mature fresh ginger (sea freight), and immature fresh ginger (airfreight), ginger in brine, ginger oil, ginger oleoresin, crystallised ginger, and ginger in syrup. It can therefore support a diverse range of enterprises supplying the fresh and processed food, confectionary, flavours and fragrances markets.

National and International regulatory framework

Ginger is a standard item of international commerce.

National and International transport costs and conditions

No special conditions apply to transport. The current export trade lives within current transport cost structure. Increased trade will reduce costs.

Customs regulations and tariffs

Established standards exist (ISO, ASTA) which enable international trade. Madagascar is under no duty/tariff disadvantage in any of the markets targeted.

Norms and certification requirements

Established standards exist (ISO, ASTA) which enable international trade.

Distribution system

Primary commercial targets are importer/dealers, and extractors.

Packaging

Polypropylene sacks of 25 kg.

Usual terms of sales and payments

Letter of credit

Conclusion

Madagascar's cost structure allows it to compete with the price setting supplier – China – and it can therefore support long term market supply. Current high market prices reflecting a supply shortage offer an attractive framework to support crop development.

Diversification of ginger products (a medium to long term opportunity) depend on a full analysis and appraisal of the physio-chemical characteristics of Madagascar ginger.

Development of (dry ginger) product quality (to support positioning of the product in the market), and maintaining/increasing price competitiveness, and increasing margins (at all levels of the production/market chain) requires technical development of production systems, crop drying systems, and producer/exporter linkages.

ANNEX 2: DRAFT PRODUCT MARKET PROFILE: GERANIUM OIL

Price Evolution:

Price – US\$/kg

1999	2000	2001	2002	2003
40.60	44.69	43.91	51.64	59.01

Prices are an average of all origins, including fractionated material re-exported from European countries. Prices of natural oils from origin will be higher. The general trend in prices is upwards as the crop is not easy to grow and the production base is limited.

Global and Regional Trends

Overall, the market is stable and showing moderate growth. Total demand is around 150 tonnes/yr, and is mainly concentrated in Europe. The bulk market is supplied by Egypt and China. The premium market was supplied by Reunion ('Bourbon' quality), but this supply has now stopped. Continuing growth of the global branded perfumery market maintains demand for high quality oils.

Main competitors

China and Egypt dominate supply to the bulk market. Unless Madagascar can produce a 'Bourbon' quality oil, it will not compete with China/Egypt. East African production has stopped, and recent attempts to revive production have failed. No new entrants to the market are likely.

Market opportunities

Core opportunity focused on the Bourbon niche market. Supply of up to 10 tonnes/yr at up to US\$100/kg.

National and International regulatory framework

Geranium oil is a standard item of international commerce.

National and International transport costs and conditions

No special conditions apply to transport. The current export trade lives within current transport cost structure. Increased trade will reduce costs.

Customs regulations and tariffs

Established standards exist (ISO, ASTA) which enable international trade. Madagascar is under no duty/tariff disadvantage in any of the markets targeted.

Norms and certification requirements

Established standards exist (ISO, ASTA) which enable international trade.

Distribution system

Primary commercial targets are importer/dealers.

Packaging

Standard PTE drums.

Usual terms of sales and payments

Letter of credit

Conclusion

Madagascar can replace Reunion production – accessing premium prices – due to its environmental conditions. Long term market development opportunities are limited – competition with China/Egypt for the bulk market is unlikely to be commercially attractive. The crop can form one part of a range of essential oils crops that can support small enterprises.